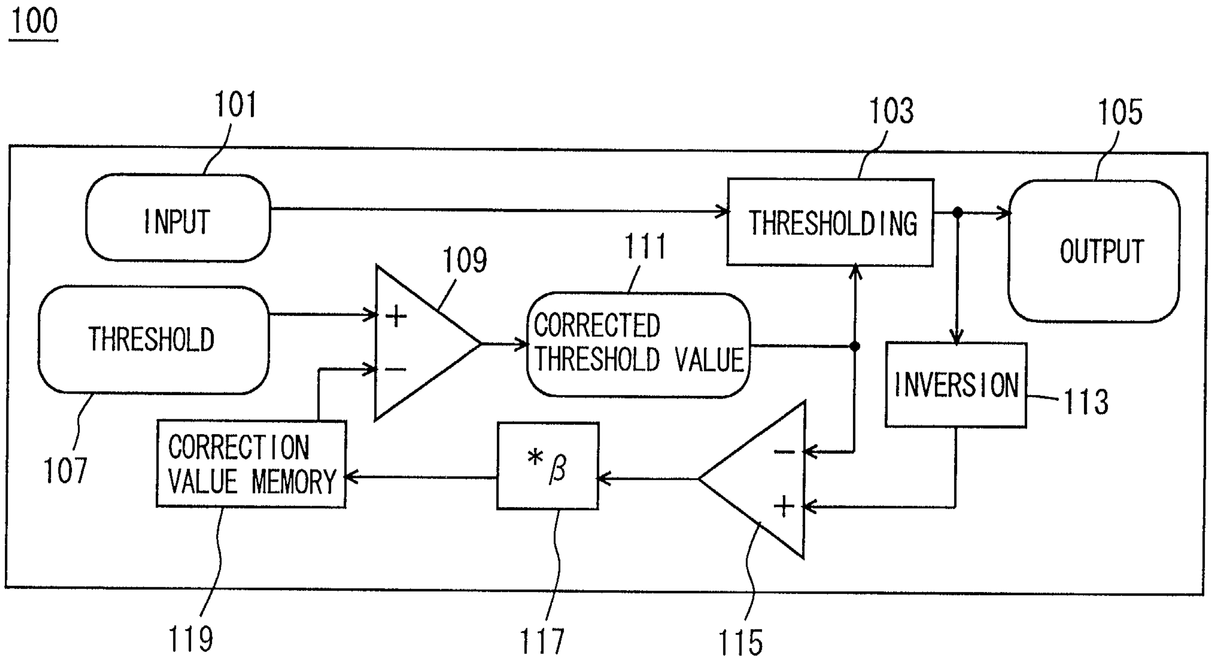
F I G. 1


100
101
INPUT
103
THRESHOLDING
105
OUTPUT
107
THRESHOLD
109
+
−
111
CORRECTED THRESHOLD VALUE
113
INVERSION
115
−
+
117
*β
119
CORRECTION VALUE MEMORY

F I G. 2

		○	32	8
2	16	32	16	4
1	4	8	2	1

FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

FIG. 8

F I G. 9

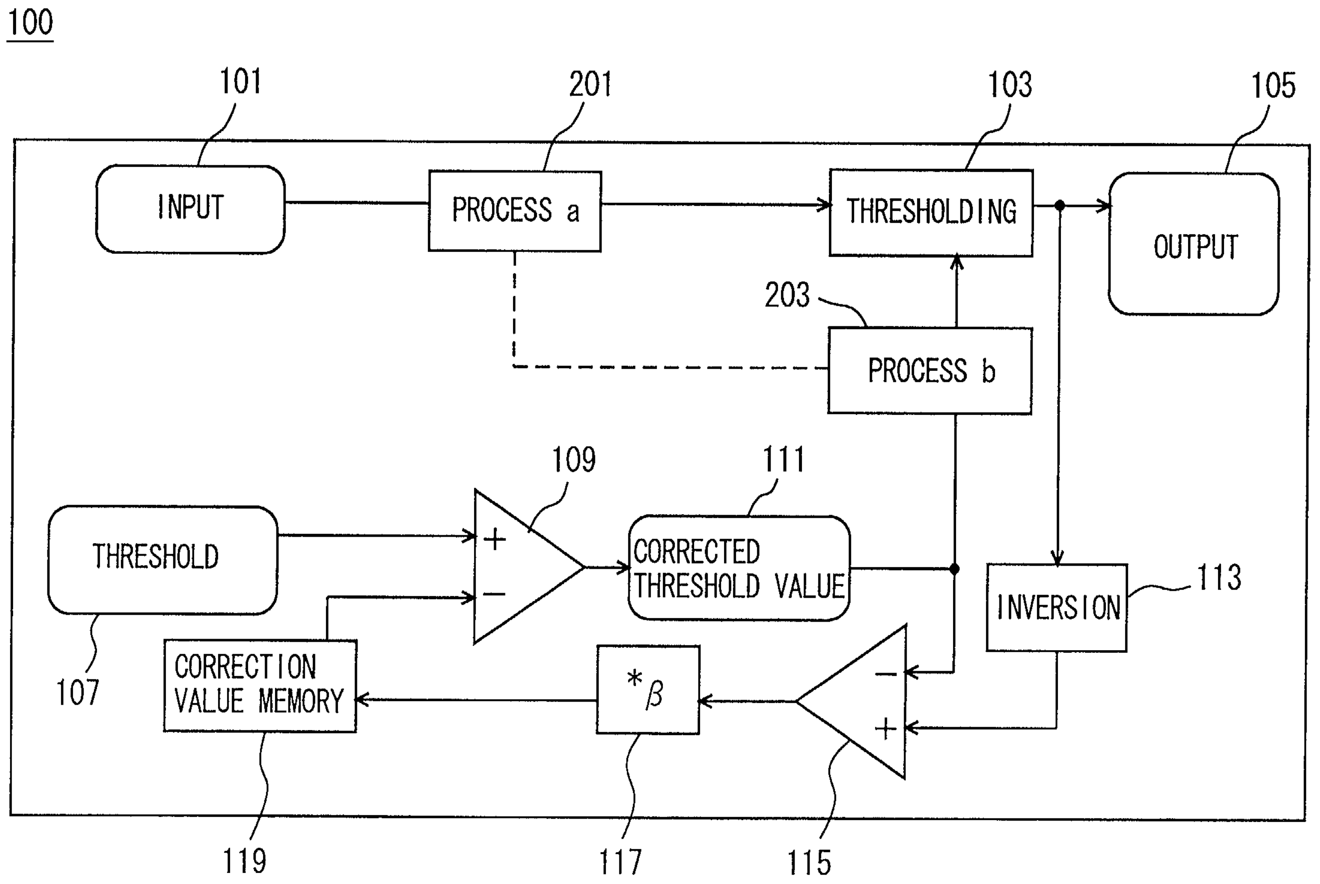

100
101
INPUT
201
PROCESS a
103
THRESHOLDING
105
OUTPUT
203
PROCESS b
109
+
−
111
CORRECTED THRESHOLD VALUE
THRESHOLD
107
INVERSION
113
CORRECTION VALUE MEMORY
*β
−
+
119
117
115

FIG. 10

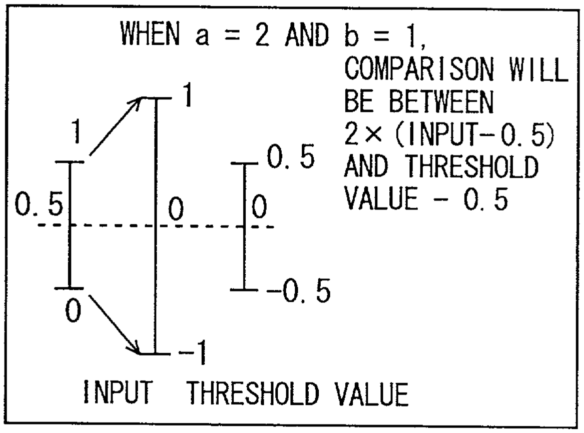

WHEN a = 2 AND b = 1,
COMPARISON WILL
BE BETWEEN
2× (INPUT−0.5)
AND THRESHOLD
VALUE − 0.5
1
0.5
0
1
0
−1
0.5
0
−0.5
INPUT
THRESHOLD VALUE

FIG. 11

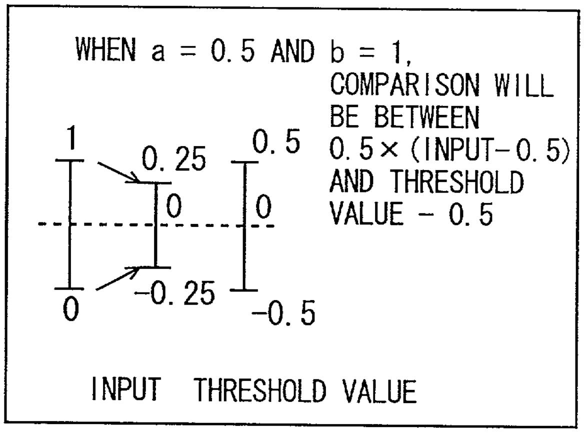

WHEN a = 0.5 AND b = 1,
COMPARISON WILL
BE BETWEEN
0.5× (INPUT−0.5)
AND THRESHOLD
VALUE − 0.5
1
0
0.25
0
−0.25
0.5
0
−0.5
INPUT
THRESHOLD VALUE

FIG. 12

EXAMPLES OF RELATION BETWEEN THE RATIO OF SET COEFFICIENTS AND DEGREE OF EDGE ENHANCEMENT

DEGREE OF EDGE ENHANCEMENT	RELATION BETWEEN COEFFICIENTS a AND b
STRONGER	$a > b$
↑	
COMPARABLE TO COMMON THRESHOLD VALUE DIFFUSION	$a = b$
↓	
WEAKER	$a < b$

FIG. 13

TABLE OF CONDITIONS FOR COEFFICIENT SETTING

	COEFFICIENT a	COEFFICIENT b	a／b	β
EXAMPLE 1	0.1	1	0.1	0.08
EXAMPLE 2	1	1	1	0.5
EXAMPLE 3	2	1	2	0.68

FIG. 17

	COEFFICIENT a	COEFFICIENT b	a／b
EXAMPLE 1'	1	10	0.1
EXAMPLE 2'	1	1	1
EXAMPLE 3'	1	0.5	2

FIG. 14

FIG. 15

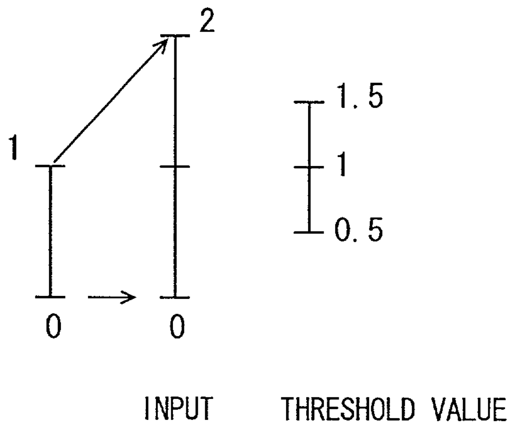
FIG. 16

F I G. 18

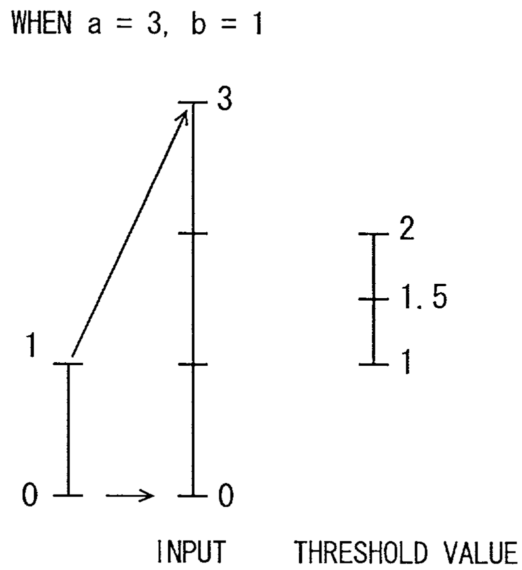
	COEFFICIENT a	COEFFICIENT b	a／b
EXAMPLE 1″	0.5	5	0.1
EXAMPLE 2″	2	2	1
EXAMPLE 3″	4	2	2

F I G. 19

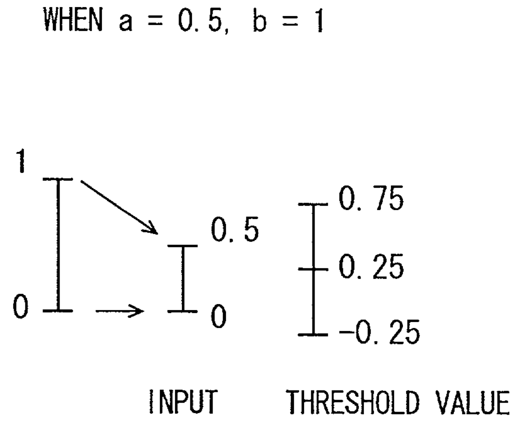
WHEN a = 2, b = 1



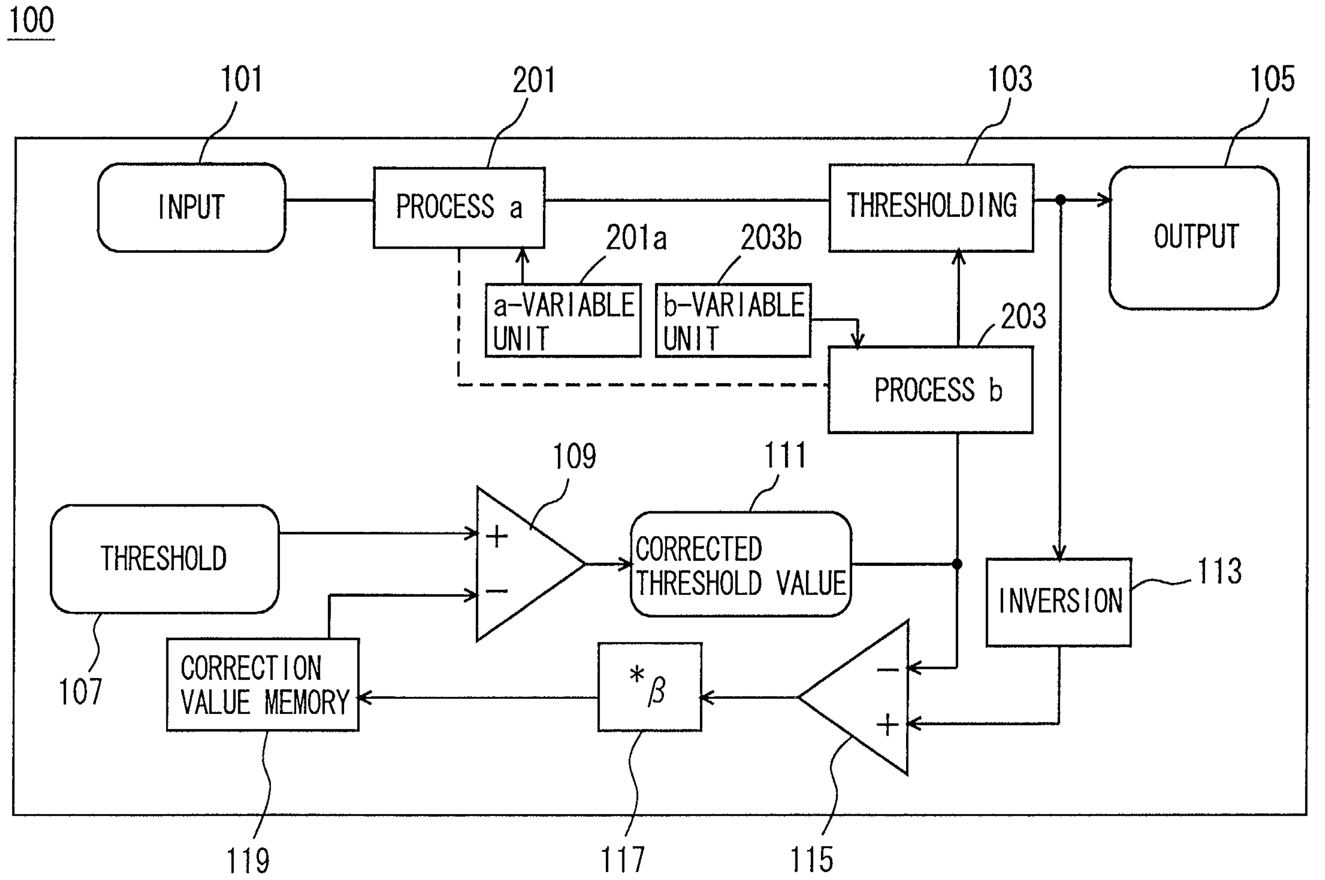
F I G. 2 0


WHEN a = 3, b = 1
3
2
1.5
1
1
0
0
INPUT
THRESHOLD VALUE

F I G. 2 1


WHEN a = 0.5, b = 1
1
0.75
0.5
0.25
0
0
-0.25
INPUT
THRESHOLD VALUE

F I G. 2 2


100
101
201
103
105
INPUT
PROCESS a
THRESHOLDING
OUTPUT
201a
203b
a-VARIABLE UNIT
b-VARIABLE UNIT
203
PROCESS b
109
111
THRESHOLD
+
−
CORRECTED THRESHOLD VALUE
INVERSION
113
107
CORRECTION VALUE MEMORY
*β
−
+
119
117
115

F I G. 2 3

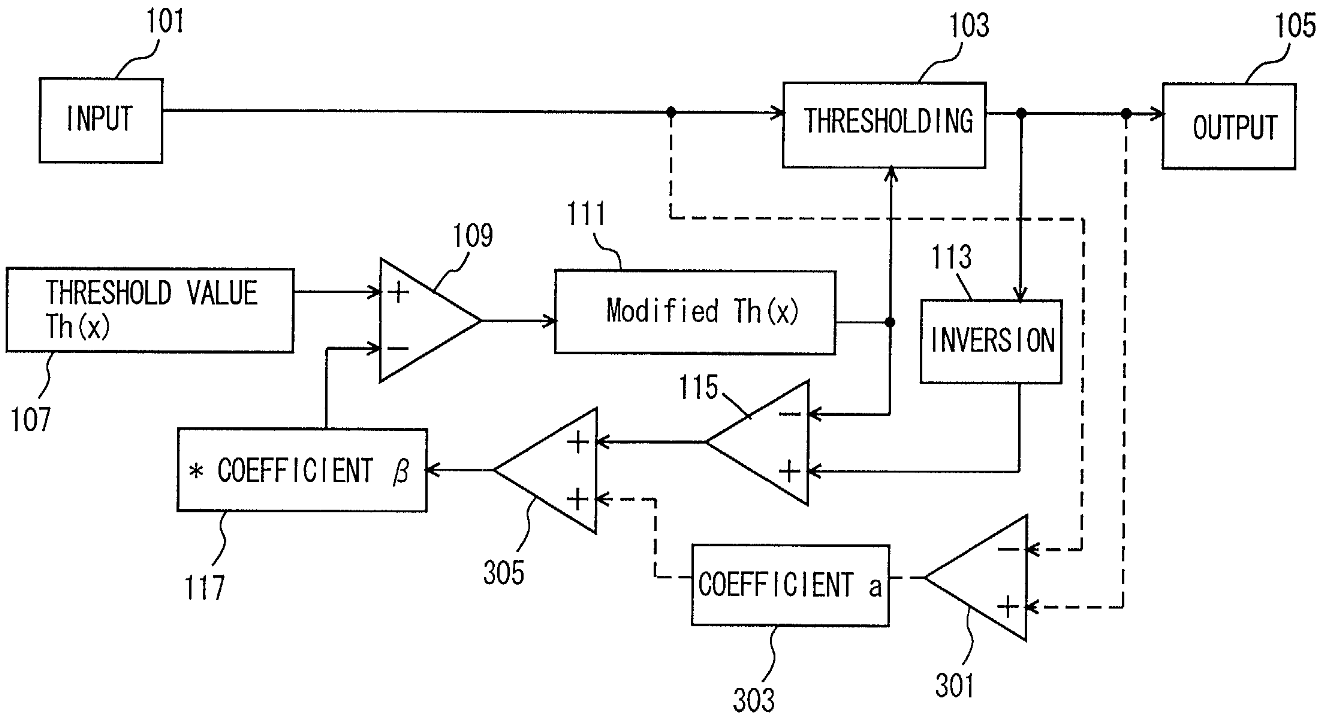
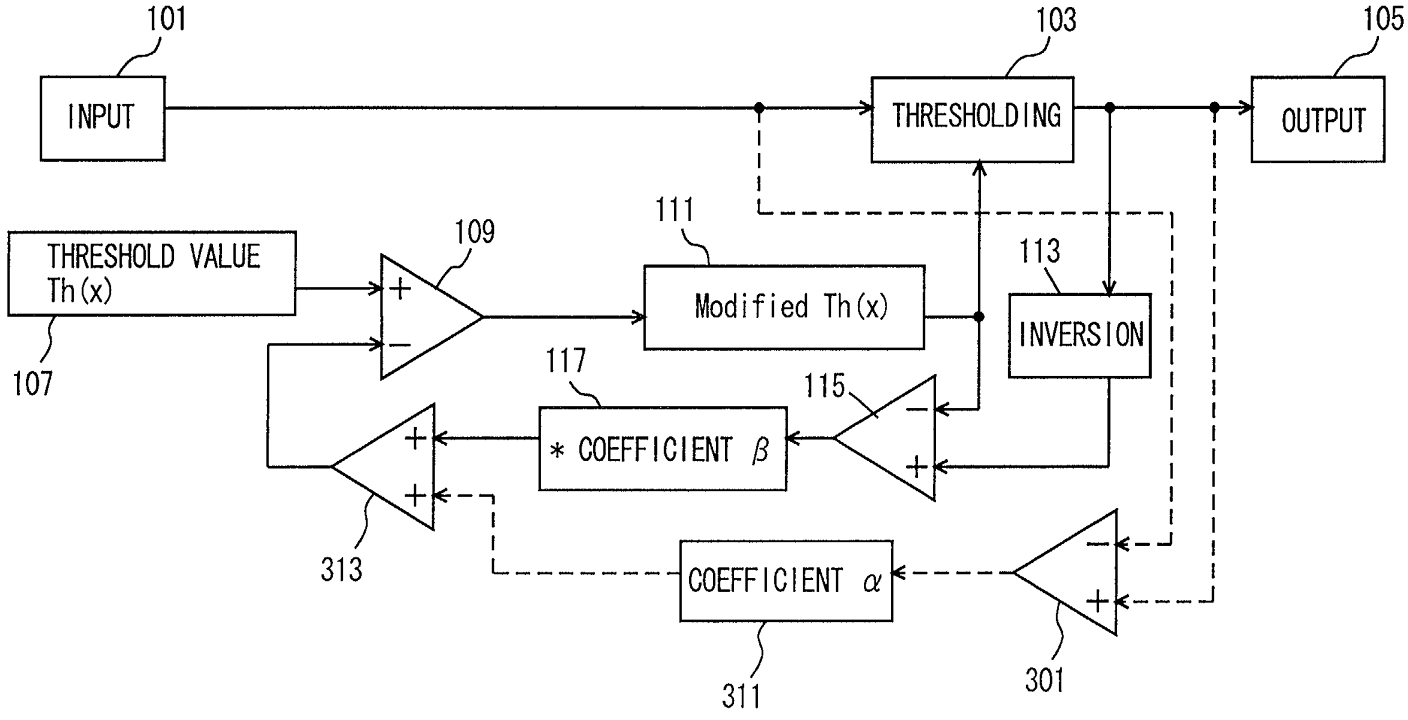
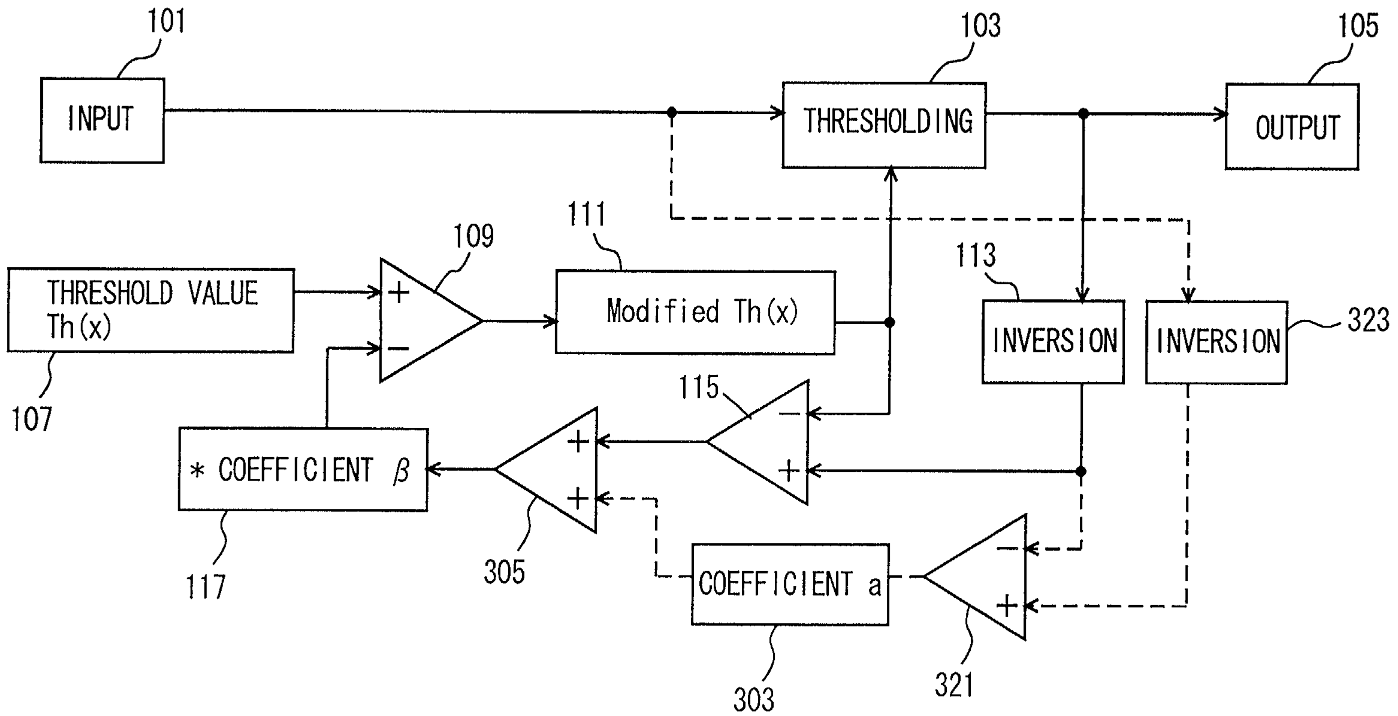

101
INPUT
103
THRESHOLDING
105
OUTPUT
111
109
THRESHOLD VALUE Th(x)
+
−
Modified Th(x)
113
INVERSION
107
115
−
+
* COEFFICIENT β
+
+
117
305
COEFFICIENT a
−
+
303
301

FIG. 24


101
INPUT
103
THRESHOLDING
105
OUTPUT
THRESHOLD VALUE Th(x)
107
109
+
−
111
Modified Th(x)
113
INVERSION
115
−
+
117
* COEFFICIENT β
313
+
+
COEFFICIENT α
311
301
−
+

F I G. 2 5



101
INPUT
103
THRESHOLDING
105
OUTPUT
111
109
THRESHOLD VALUE Th(x)
+
−
Modified Th(x)
113
INVERSION
INVERSION
323
107
115
−
+
* COEFFICIENT β
+
+
117
305
−
+
COEFFICIENT a
303
321

F I G. 2 6

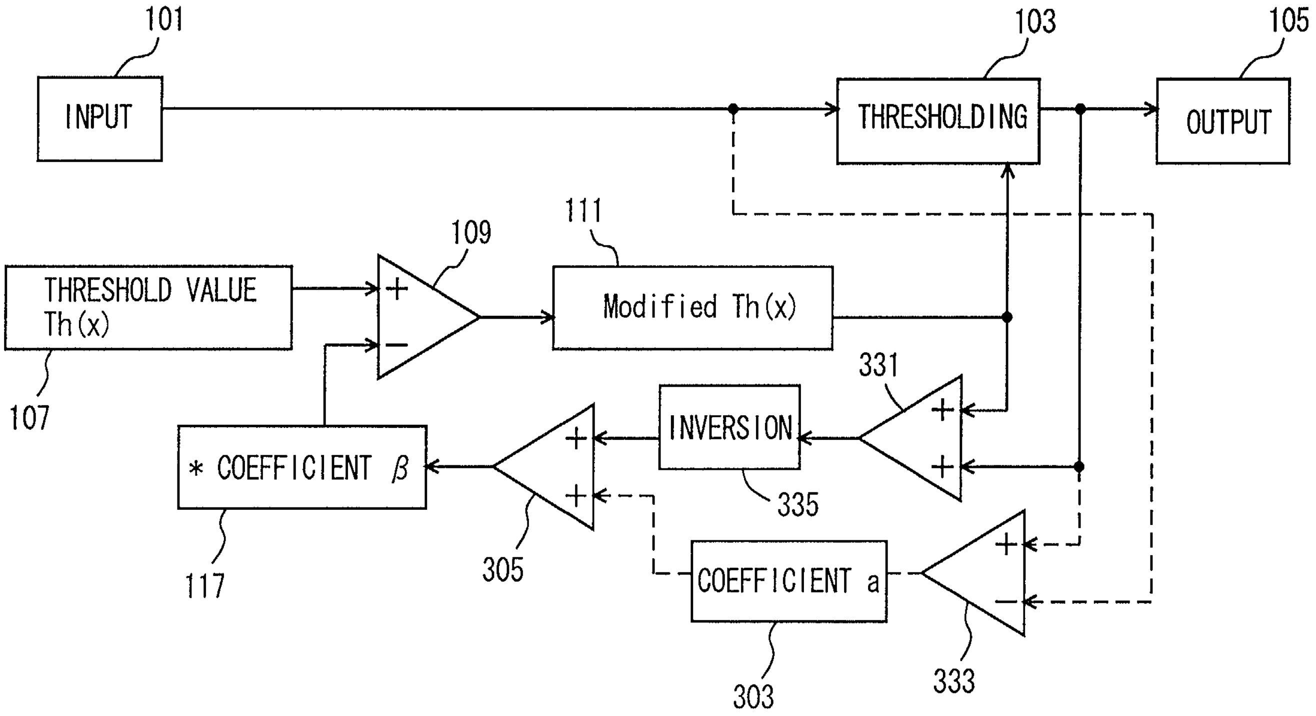

101
INPUT
103
THRESHOLDING
105
OUTPUT
111
109
THRESHOLD VALUE Th(x)
+
−
Modified Th(x)
107
331
+
+
INVERSION
+
+
* COEFFICIENT β
335
305
117
COEFFICIENT a
+
−
303
333

FIG. 27

EXAMPLES OF RELATION BETWEEN THE VALUE OF SET COEFFICIENTS AND DEGREE OF EDGE ENHANCEMENT

DEGREE OF EDGE ENHANCEMENT	COEFFICIENTS a
STRONGER	$a > 0$
↑	
COMPARABLE TO COMMON THRESHOLD VALUE DIFFUSION	$a = 0$
↓	
WEAKER	$a < 0$

FIG. 28

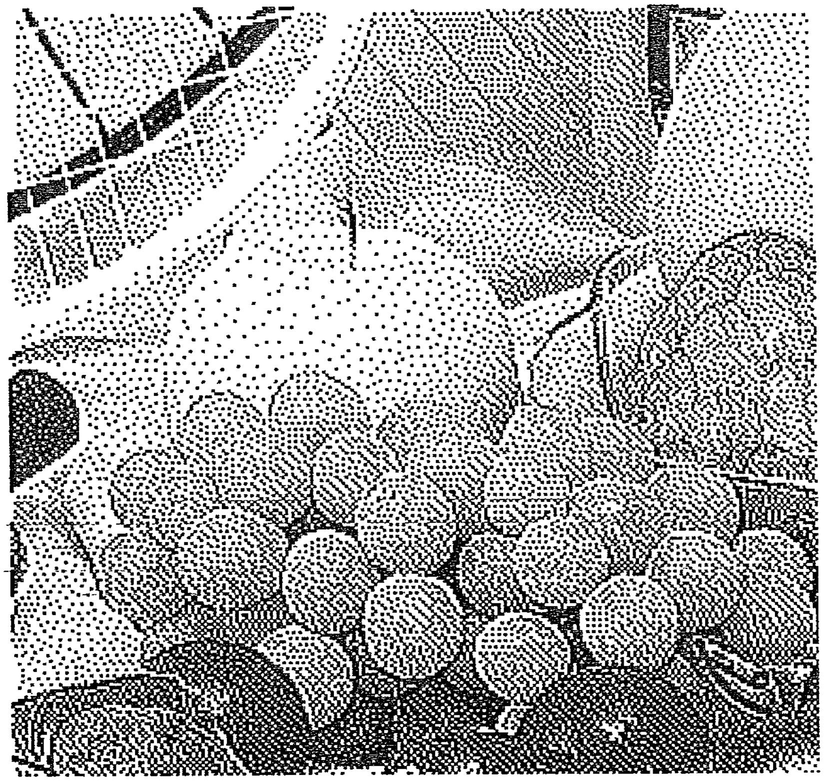
TABLE OF SET COEFFICIENT VALUES

	COEFFICIENT a	
RESULT 1	0. 5	STRONG EDGE ENHANCEMENT
RESULT 2	0. 2	↑
RESULT 3	0	STANDARD THRESHOLD VALUE DIFFUSION
RESULT 4	−1	↓
RESULT 5	−5	WEAK EDGE ENHANCEMENT
ERROR DIFFUSION	—	STANDARD ERROR VALUE DIFFUSION

FIG. 29

RESULT 1

FIG. 30

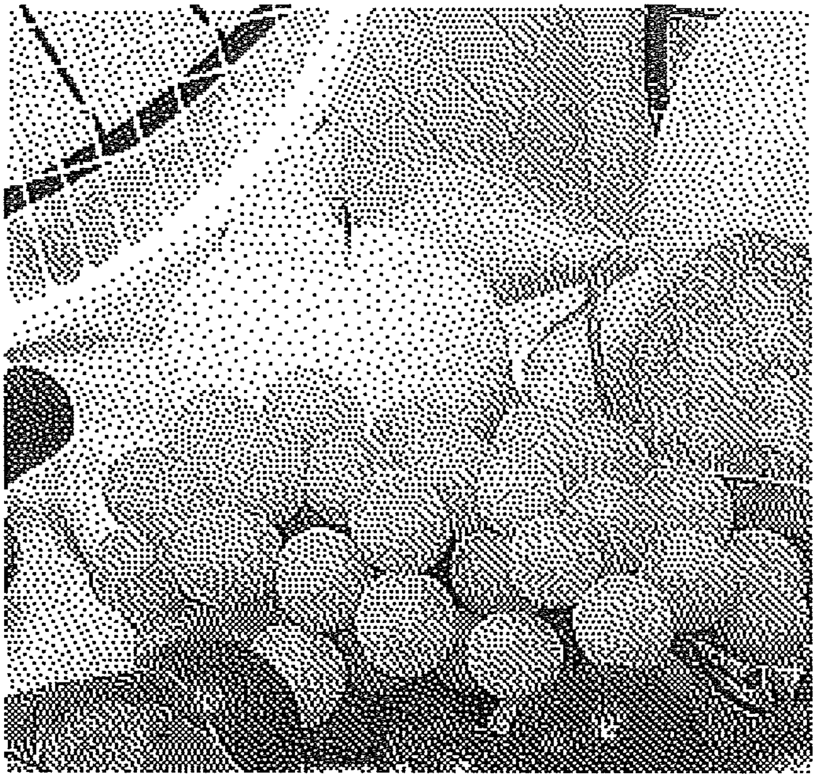


RESULT 2

FIG. 31

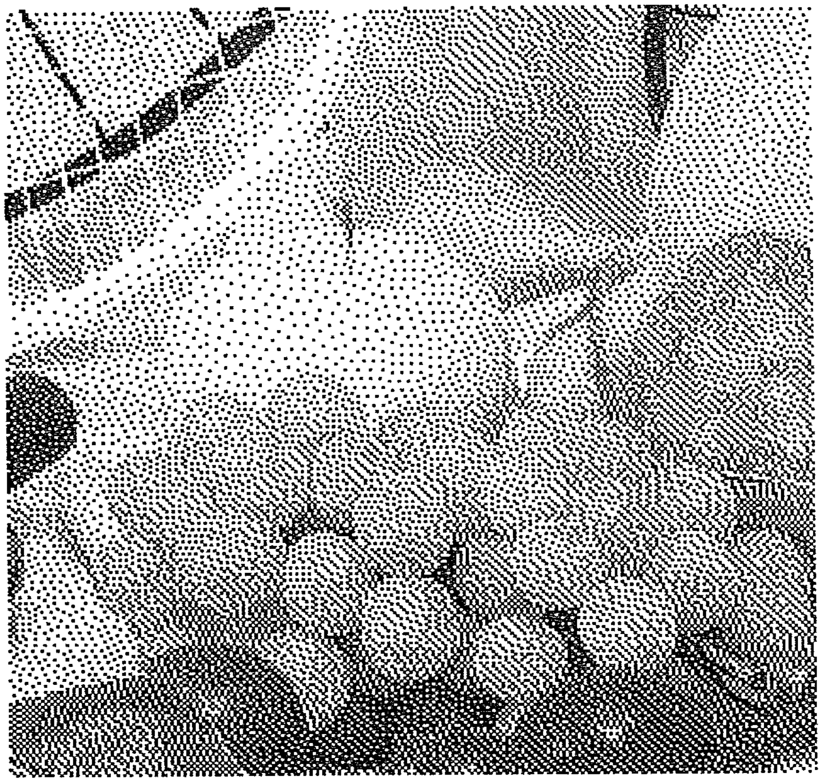
RESULT 3

FIG. 32



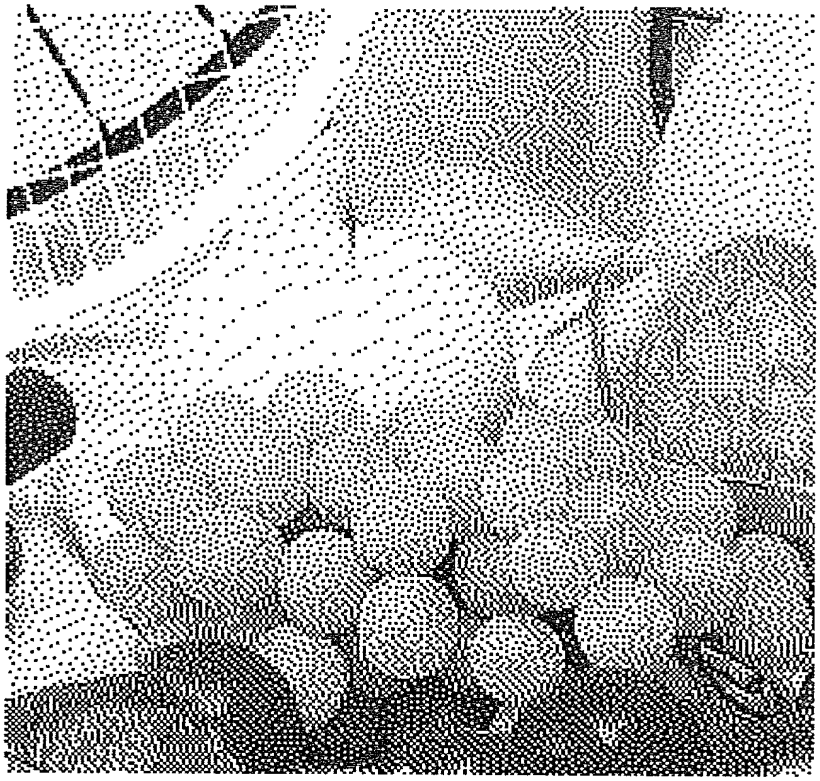
RESULT 4

FIG. 33



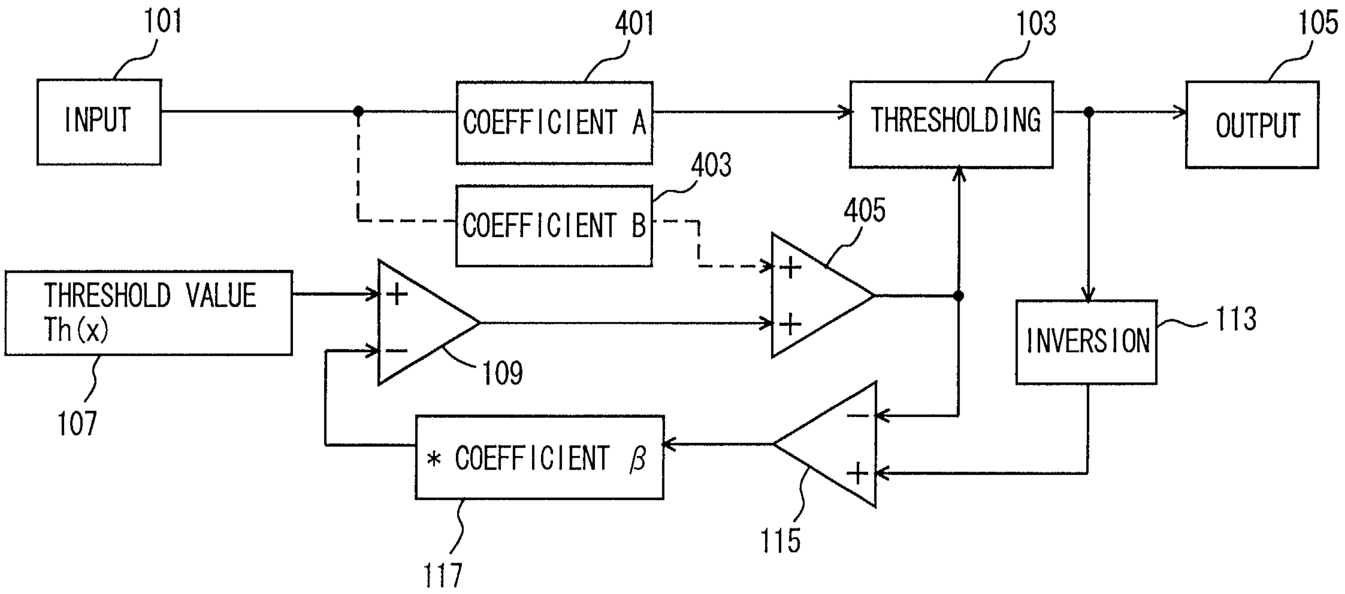
RESULT 5

FIG. 34

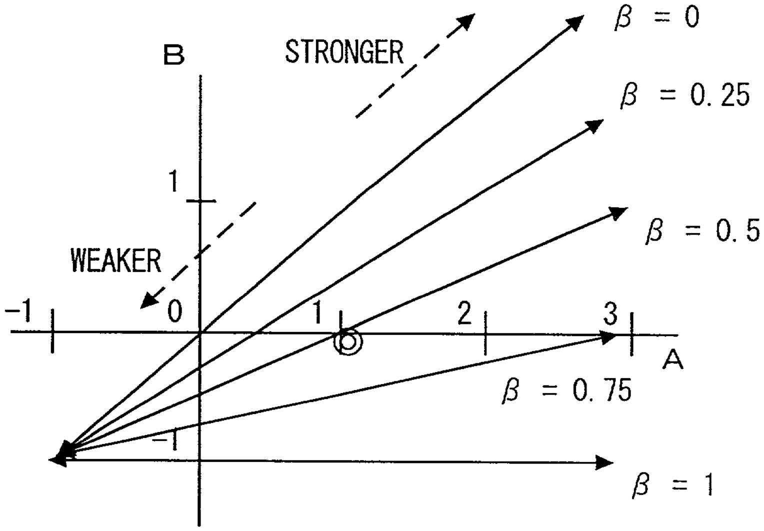


ERROR DIFFUSION

F I G. 3 5


101
INPUT
401
COEFFICIENT A
403
COEFFICIENT B
103
THRESHOLDING
105
OUTPUT
405
+
+
THRESHOLD VALUE
Th(x)
107
+
−
109
113
INVERSION
−
+
115
* COEFFICIENT β
117

F I G. 3 6



F I G. 3 7

β = 0.25

	WEAK				STRONG
A	−1	0	1	2	3
B	−1	−0.25	0.5	1.25	2

β = 0.5 (STANDARD THRESHOLD VALUE DIFFUSION)

	WEAK		STD		STRONG
A	−1	0	1	2	3
B	−1	−0.5	0	0.5	1

β = 0.75

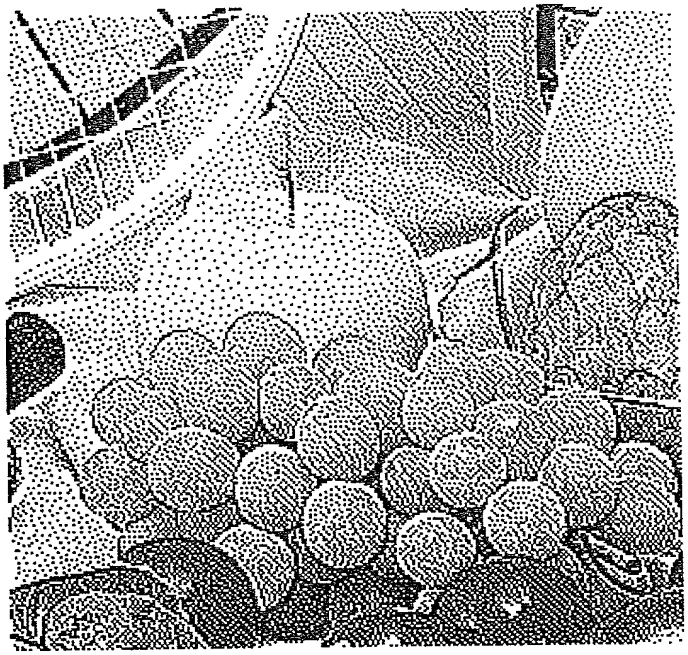
	WEAK		STRONG	STRONG	STRONG
A	−1	0	1	2	3
B	−1	−0.75	−0.5	−0.25	0

FIG. 38

TABLE OF SET COEFFICIENT VALUES (IN RESULTS 1 TO 5, $\beta = 0.5$)

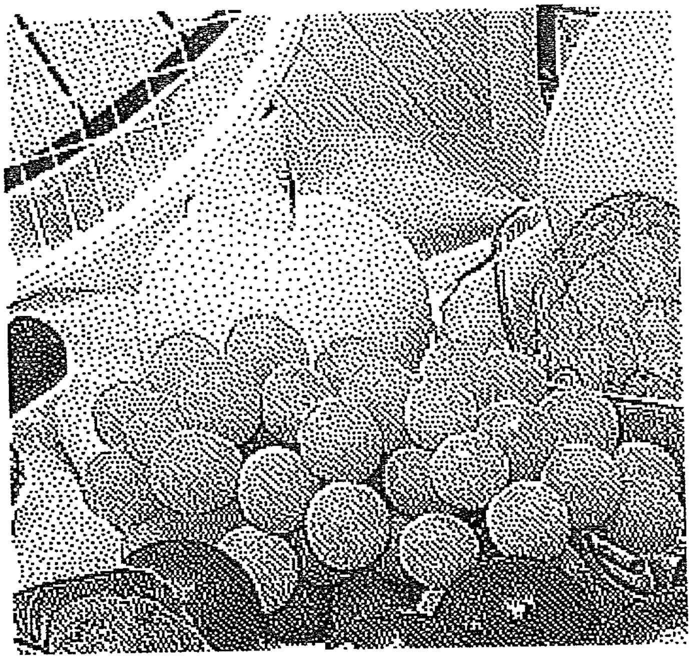
	COEFFICIENT A	COEFFICIENT B	
RESULT 1	3	1	STRONG EDGE ENHANCEMENT
RESULT 2	2	0.5	↑
RESULT 3	1	0	STANDARD THRESHOLD VALUE DIFFUSION
RESULT 4	0	−0.5	↓
RESULT 5	−1	−1	WEAK EDGE ENHANCEMENT
ERROR DIFFUSION	—	—	STANDARD ERROR VALUE DIFFUSION

FIG. 39



RESULT 1

FIG. 40

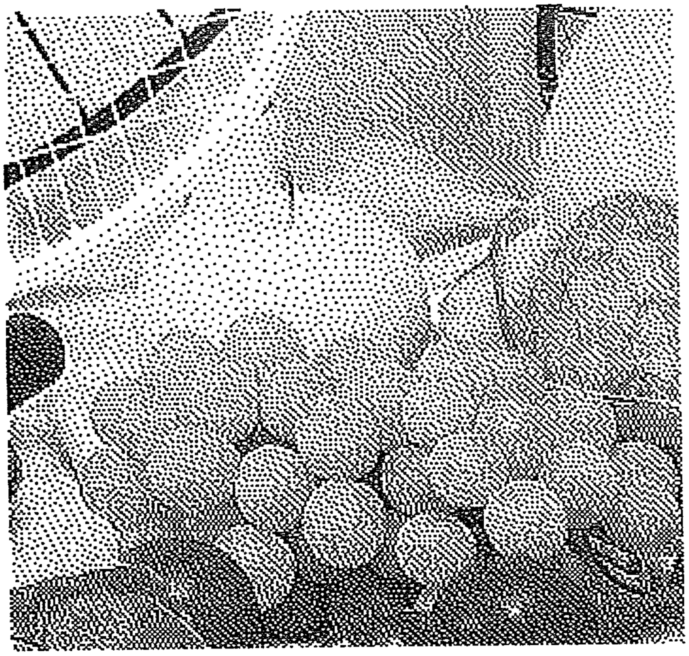


RESULT 2

FIG. 41

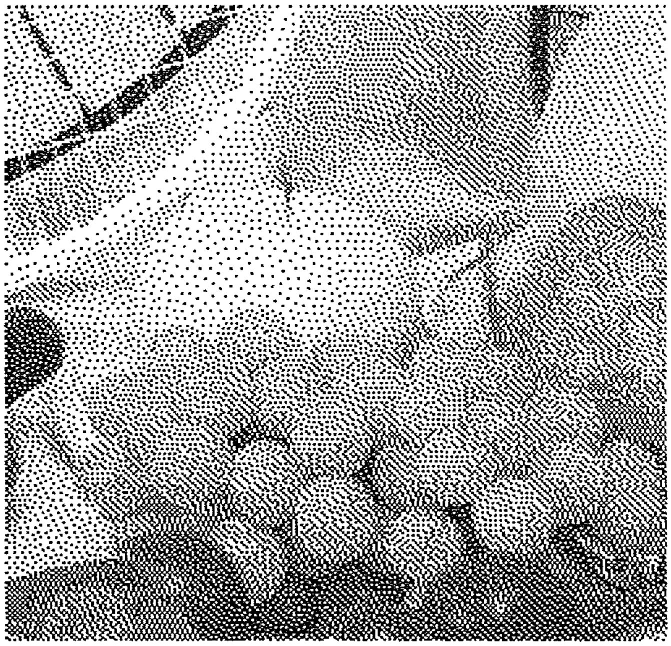
RESULT 3

FIG. 42



RESULT 4

FIG. 43

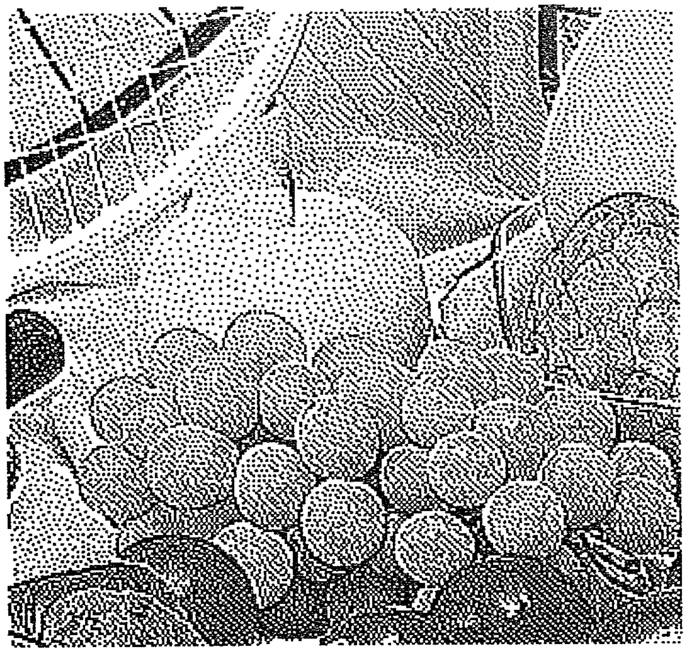


RESULT 5

F I G. 4 4

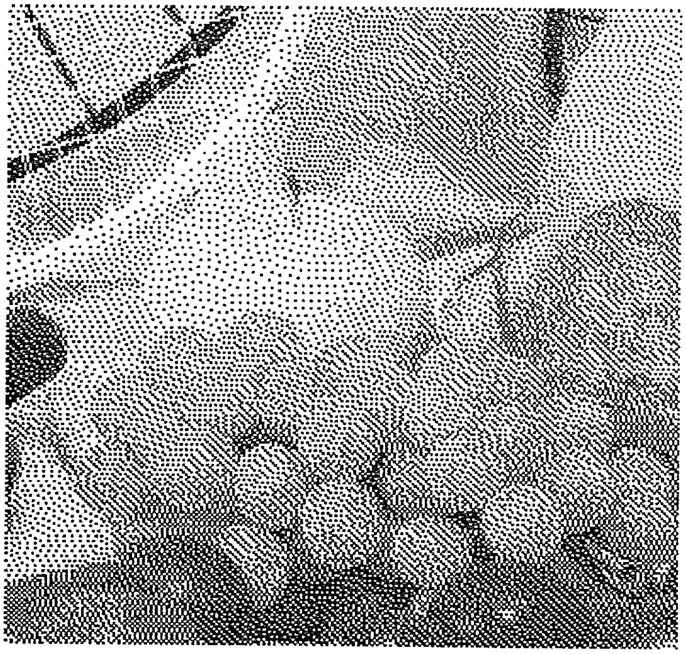
	COEFFICIENT A	COEFFICIENT B	COEFFICIENT β	
RESULT 6	3	2	0.25	STRONG EDGE ENHANCEMENT
RESULT 7	−1	−1	0.25	WEAK
RESULT 8	3	0	0.75	STRONG EDGE ENHANCEMENT
RESULT 9	−1	−1	0.75	WEAK

FIG. 45



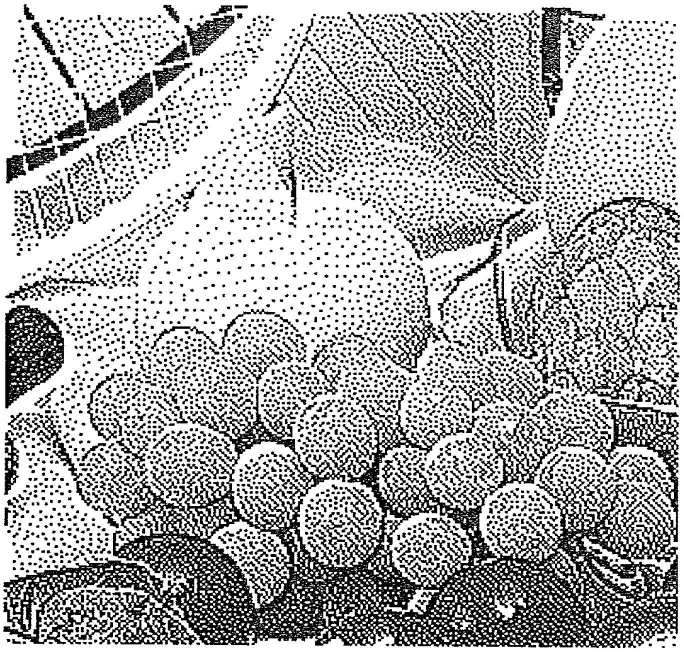
RESULT 6

FIG. 46



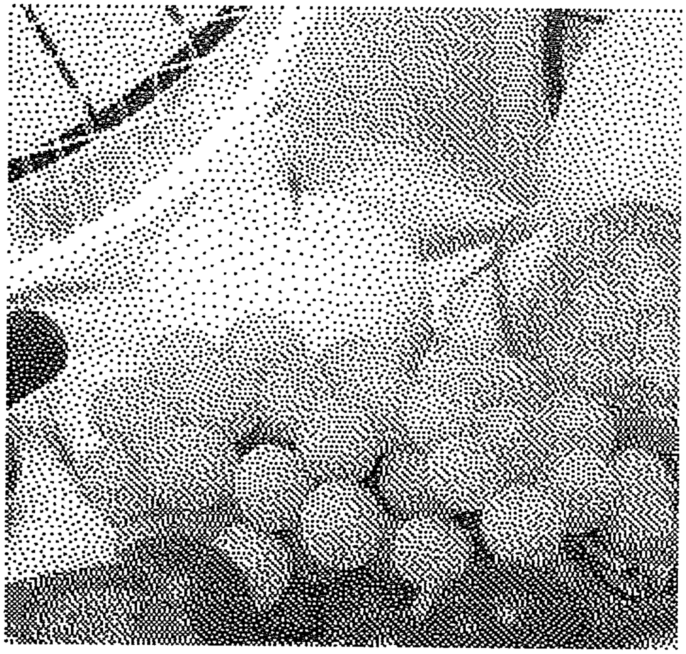
RESULT 7

FIG. 47



RESULT 8

FIG. 48



RESULT 9

F I G. 4 9 PRIOR ART